



PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P1363WOD	FOR FURTHER ACTION		See Form PCT/PEA416
International application No. PCT/GB2004/002182	International filing date (day/month/year) 20.05.2004	Priority date (day/month/year) 06.06.2003	
International Patent Classification (IPC) or national classification and IPC G01R33/44			
Applicant THE SECRETARY OF STATE FOR DEFENCE et al.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 807 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input checked="" type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input checked="" type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 07.12.2004		Date of completion of this report 07.07.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel: +49 89 2399 - 0 Tx: 523658 apmu d Fax: +49 89 2399 - 4465		Authorized Officer Lersch, W Telephone No. +49 89 2399-2531 	

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/GB2004/002182

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☒ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:

- ☐ International search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements* of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*.

Description, Pages

1-9 as originally filed

Claims, Numbers

1-12 as originally filed

Drawings, Sheets

1-4 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (specify):
- ☐ any table(s) related to sequence listing (specify):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (specify):
- ☐ any table(s) related to sequence listing (specify):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**International application No.
PCT/GB2004/002182**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability.**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 12

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 12 are so unclear that no meaningful opinion could be formed (*specify*):

see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos.

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form

☐ has not been furnished

☐ does not comply with the standard

the computer readable form

☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.

☐ See separate sheet for further details

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-11
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-11
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

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IP16 Rec'd PCT/PTO 06 DEC 2005**INTERNATIONAL PRELIMINARY
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The present opinion is based on the following application documents:

Description, pages:

1-9 as originally filed

Claims, No.:

1-12 as originally filed

Drawings, sheets:

1-4 as originally filed.

ad III:

For lack of any concrete features the scope of claim 12 is obscure. Moreover, claim 12 does not satisfy the requirements of Rule 6.2(a) PCT.

ad V:**1.) Lack of an Inventive Step (Article 33(1), (3) PCT)****1.1 Reference is made to the following documents:**

D1 = US-A-5 206 592

D2 = WO-A-99/45409

D3 = EP-A-1 416 291

D4 = US-A-6 486 838

D5 = MRM 11 (1989) 405-412

D6 = US-A-2002/011842

D7 = JMR 85 (1989) 24-34.

1.2 Claim 1

- a) The subject-matter of claim 1 would appear to lack an inventive step with respect to document D1 for the following reasons.

Document D1 discloses (see, e.g., the passages cited in the search report): an NQR inspection system for simultaneously detecting the presence of a plurality of target materials (see D1, col. 5, lines 35-38) comprising transmission means and a receiver circuit (see D1, e.g., fig. 1), which comprise a multi-resonant

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circuit (see D1, col. 5, line 39) tuned to simultaneously transmit and receive a plurality of signals at a plurality of predetermined frequencies which match characteristic resonant frequencies of a plurality of target materials (this is implicitly disclosed by the passage in col. 5, lines 31-39 of D1 and the reference to "multiply tuned coils" at the end thereof). D1 does not explicitly disclose the use of a passive circuit protection means. However, such means are routinely used in NQR apparatus (see, e.g., document D4, figs. 1,3,5) as well as in multi-resonance spectroscopy (see, e.g., document D5, pages 406,408,409) such that no inventive step is considered to be involved in using corresponding means also in combination with the system disclosed in D1.

- b) The subject-matter of claim 1 would appear to lack an inventive step also with respect to document D2 for the following reasons.

The kind of "target materials" to be detected is in no way specified in claim 1, nor are the "characteristic resonant frequencies". Therefore, any NQR system capable of operating simultaneously at a plurality of different frequencies may come within the scope of claim 1. The NQR inspection system disclosed in D2 is a system of just this type since it is arranged to detect NQR resonances simultaneously at a plurality of different frequencies (see D2, e.g., the passages cited in the search report). When provided with "passive circuit protection means" (which are not explicitly mentioned in D2 but are routinely used with such apparatus, see above) the system would appear to come within the scope of claim 1.

1.3 Claims 2-11

These dependent claims do not appear to contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step; the reasons being as follows. The additional features of claims 2-4, 7 and 8 would appear to be at least implicitly known already from document D1 and/or document D2 (whereby it is noted that the formulations used in claims 3 and 4 are so vague that these claims cover also an embodiment like the one

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depicted in fig. 2 of D3 which would appear to be the kind of embodiment the skilled person would associate with the disclosure in col. 5, lines 35-39 of D1; moreover the use of an intermediate frequency for the purpose of enabling the processing of signals from several resonance lines in a single receiver would appear to come within the customary practice followed by those skilled in the art, see, for instance, document D6, e.g. §42). The additional features of claim 5 appear to involve merely an obvious possibility of designing the passive protection circuit, see, for instance, the above-cited documents D4 and D5. The additional features of claim 6 would appear to involve merely an obvious possibility of designing a multi-resonant circuit, see, for instance, document D7. The pulse sequences suggested in claims 9 and 10, respectively, would appear to be routinely used (see, for instance, D2, page 30, lines 5-23). The additional features of claim 11 would appear to involve merely a design possibility which readily occurs to those skilled in the art in view, for instance of document D2, see, e.g., page 28, lines 21-28.

ad VI:

It is merely mentioned that the late published document D3 is particularly relevant to claims 1-4 and 7.

ad VII:

- 1.) Claim 1 should be properly cast in the two-part form.
- 2.) To satisfy the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1, D2 and D4-D7 should be mentioned in the description, and these documents should be identified therein.

ad VIII:

- 1.) Claim 1
 - a) Definition of the system in terms of properties (viz. "resonant frequencies") of

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(unspecified) materials to be investigated with the system renders the scope of the claim obscure.

- b) For clarity, the materials comprised by the "plurality of target materials" should be specified to be different from one another.
- c) Also for clarity, the sample should be specified to be a sample which is suspected of containing any of the target materials.
- d) It is not clear whether each of the "transmission means" and the "receiver circuit" comprises a separate "multi-resonant circuit".
- e) It is not clear whether the formulation "to simultaneously transmit and receive" implies that signals are received truly concurrently with the application of excitation pulses, i.e. that transmission and reception occur at the very same time.
- f) It is obscure in which respect the "protection means" are a prerequisite "to permit simultaneous reception of a plurality of return signals". It appears that the mere presence of a multi-tuned receiver circuit already permits this simultaneous reception.

2.) Claim 7

It is obscure which concrete limitations this claim imposes on the system according to claim 1.

3.) Claims 8 and 11

These claims render the meaning of the term "simultaneous" in claim 1 obscure. A clear distinction should be made between events which occur truly simultaneously and events which occur sequentially in time. It is already noted that a formulation like "substantially simultaneously" would clearly not be suitable for providing this distinction.

4.) Claims 9 and 10

Specification of the pulse sequences to be used with the system according to claim 1 would not appear to impose any clear limitations on that system.

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Further Remarks:

- 1.) When filing amended claims the applicant should at the same time bring the description into conformity with the amended claims.
- 2.) In order to facilitate the examination of the conformity of the amended application with the requirements of Article 19(2) PCT, the applicant is requested to clearly identify the amendments carried out, irrespective of whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based. Otherwise, the amendments might not be taken into account for the purposes of an international preliminary examination report.

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